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Publisher *Taylor & Francis*

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The Journal of Adhesion

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713453635>

Toshio Hata — A Tribute on his 85th Birthday

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To cite this Article Nose, Takuhei(1998) 'Toshio Hata — A Tribute on his 85th Birthday', The Journal of Adhesion, 65: 1, 1 — 3

To link to this Article: DOI: 10.1080/00218469808012234

URL: <http://dx.doi.org/10.1080/00218469808012234>

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Toshio Hata – A Tribute on his 85th Birthday

Toshio Hata was born in Osaka, Japan, on January 5, 1913. He obtained his B.S. in Applied Chemistry and his Ph.D. degree in Engineering from the Tokyo Institute of Technology (TIT). He started his research career as a Research Associate at TIT in 1940, became an Associate Professor in 1945, and a Professor in the Department of Polymer Chemistry at TIT in 1964. Immediately after retiring from TIT, he moved to Gunma University as a Professor in 1973, and served as the President of the University (1975–1981). He is an Emeritus Professor of both TIT and Gunma University.

His research interest was initially the structure and physical properties of polymeric fibers, and then it became oriented to the surface chemistry of polymers and to adhesion. When Professor Hata was a Professor at TIT, the scope of his research interests became broadened in the area of polymer physics and engineering: Rheological properties and molecular motions of polymeric materials, polymer blends and composites, and surface and interfacial properties including basic surface phenomena and adhesion. He continued his research work associated with polymer interfaces at Gunma University.

Even after retiring from the University, his willingness and ability to engage in scientific activity has never



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dropped off and his interest has been concentrated more on composite materials and pressure-sensitive adhesion.

Three examples of the scientific achievements of Professor Hata are especially referred to in the following. Firstly, he derived an equation relating the peeling strength, P , to the work of adhesion, W_a , as a function of peeling angle, θ . That is, in 1947, he proposed the equation $P = W_a / [(\rho / (\rho + c_s) - \cos\theta)]$ taking the thickness, c_s , and the radius of curvature, ρ , of the surface of the substrate into account. Secondly, Professor Hata introduced the concepts of rheology to adhesion to combine adhesion and rheology, which may be the most distinguished achievement among his scientific contributions. He derived, in 1964, an equation describing the peeling-rate dependence of peeling strength to demonstrate the important role of viscoelastic deformation of the adhesive in pressure-sensitive adhesion. For his achievements in the rheological approach to adhesion, he became an Honorary member of the Society of Rheology, Japan, in 1989. Thirdly, Professor Hata published a great number of experimental data of surface tension, interfacial tension and contact angle for a wide variety of polymeric materials, and proposed methods of extracting characteristic molecular interaction parameters from these data.

Professor Hata has been of great service to the adhesion community, and his seminal contributions to adhesion science have been well-recognized and appreciated by the community. He devoted his efforts to founding the Adhesion Society of Japan (ASJ) in 1964. He was its second President (1968–1972), and still serves as the Chairman of a panel committee on pressure-sensitive adhesion (1980–present). Also, Professor Hata was the founder and President of the Japan Adhesive Institute from 1971–1995. His great efforts were rewarded in the realization of the first international conference on adhesion in Japan, *International Adhesion Symposium in Japan (IAS'94 Japan)*, held in Yokohama in 1994, and the *International Pressure-Sensitive Adhesion Techno-Forum '97 in Tokyo (IPSAT'97 Tokyo)* in November 1997.

His distinguished contributions to the Society of Polymer Science, Japan (SPSJ), should also be referred to. He served as the Chairman of the Research Group on Adhesion and Coating, and is a member of the Board of Trustees of SPSJ.

Numerous friends worldwide and the former students of Professor Hata wish him good health and fruitful activity in the years to come.

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